

CLAIM AMENDMENTS

Claims 11-32 are pending; claims 1-10 have been canceled; claim 11 has been amended; and claims 20-32 are newly added.

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1 Claims 1-10 (canceled)

1 11. (currently amended) An apparatus for providing public and private mobile  
2 communication service in a mobile communication system including public cell areas each having  
3 a corresponding public base station transceiver subsystem for communicating with mobile stations  
4 having access to a public mobile communication service, a plurality of public base station controllers  
5 for communicating with the public base station transceiver subsystems, a public mobile switching  
6 center for communicating with said public base station controllers and with a public switched  
7 telephone network and an integrated services digital network, said public mobile switching center  
8 being connected to a location register unit including a public home location register and a public  
9 visitor location register, said apparatus comprising:

10 public and private communication service unit for communicating with an Internet protocol  
11 network, one of said public base station controllers, said public switched telephone network and said  
12 integrated services digital network; and

13 a private base station transceiver subsystem for communicating with a mobile station within  
14 a common cell area in which said mobile station can communicate with a private mobile  
15 communication service and said public mobile communication service, wherein said mobile station

16 in said common cell area is registered in a private visitor location register included in said public and  
17 private communication service unit for enabling said mobile station in said common cell area to  
18 communicate with said private mobile communication service, and is further registered in at least  
19 one of said public home location register and said public visitor location register for enabling said  
20 mobile station in said common cell area to communicate with said public mobile communication  
21 service The apparatus as set forth in claim 10, said public and private communication service unit  
22 comprising:

A 23 a call manager which is a main controller of the public and private communication  
24 service unit;

25 a private branch exchange connected to said public switched telephone network and  
26 said integrated services digital network; and

27 a first private base station controller for communicating with said mobile station  
28 within said common cell area, said public base station controller, said call manager and said  
29 private branch exchange.

1 12. (original) The apparatus as set forth in claim 11, said first private base station controller  
2 comprising:

3 a private communication interconnection network for analyzing a message type and  
4 origination addresses and termination addresses included in a received message, and then transmits  
5 the analyzed information via a communication path to one of said private base station transceiver  
6 subsystem, said public base station controller, said call manager and said private branch exchange;

7 and

8 a transcoder and selector bank for traffic data interfacing between said private branch  
9 exchange and said first private base station controller.

1 13. (original) The apparatus as set forth in claim 12, wherein said transcoder and selector  
2 bank performs a 2.048Mbps and 1.544Mbps non-multiple transmission channel interfacing function,  
3 a vocoder function for voice coding and decoding, a soft handoff control and voice selecting  
4 function, and a power control function.

1 14. (original) The apparatus as set forth in claim 12, said first private base station controller  
2 comprising an Internet protocol network interface board assembly module connected to the private  
3 communication interconnection network for controlling a wireless in-building data service and has  
4 a function of transmitting, to a local area network, packet data received from the mobile station in  
5 said common cell area, which uses a point-to-point protocol server and a TCP/IP (Transmission  
6 Control Protocol/Internet Protocol).

1 15. (original) The apparatus as set forth in claim 11, said call manager includes software  
2 blocks consisting of:

3 a data communication interface for interfacing communication between the private  
4 communication interconnection network and the call manager;

5 a message router for managing path designation for every message to be processed in the

6 private base station transceiver subsystem;

7 a second private base station controller performs as a main controller of the first private base  
8 station controller and controls the private base station transceiver subsystem;

9 a private mobile switching center for performing interfacing for interworking with the private  
10 branch exchange and for determining whether to process a requested service as the public mobile  
11 communication service or the private mobile communication service;

12 a private branch exchange mobile interface controller for controlling a wire and wireless  
13 complex function;

14 a short message service controller for managing a short message service control function and  
15 a short message service web server function;

16 a private visitor location register for managing the private mobile communication service-  
17 registered subscriber information, the private mobile communication subscribers location registration  
18 information, and various functional service information;

19 a wire service manager for managing the whole mobile communication service function  
20 provided from the public and private communication service unit; and

21 a local area network interface module for managing communication with the local area  
22 network.

1 16. (original) The apparatus as set forth in claim 15, wherein said message router designates  
2 a signaling message path for public and private call origination and termination services of the  
3 mobile station by consulting a router table therein, and designates a message path for a maintenance

4 service of the private base station transceiver subsystem.

1 17. (original) The apparatus as set forth in claim 16, wherein said message router determines  
2 whether a message to said call manager from said mobile station in said common cell area is a  
3 service request corresponding to an event stored in a router table disposed in said message router,  
4 and stores event information corresponding to one or more of a call origination service, a call  
5 termination service, a call transfer service, a call forwarding service, a wireless in-building data  
6 service, a wireless in-building short message service and a location registration service;

7 said message router performing a location registration service operation to enable said  
8 mobile station to receive the private mobile communication service in said common cell area, when  
9 it is determined that the message from said mobile station corresponds to said location registration  
10 service; and

11 wherein said message router transmitting a message to said mobile station in said common  
12 cell area to inform said mobile station that it is registered for the private mobile communication  
13 service in the common cell area.

1 18. (original) The apparatus as set forth in claim 17, wherein said location registration  
2 service operation comprises:

3 transmitting the message corresponding to said location registration service via a  
4 communication path from said message router to said public home location register and said public  
5 visitor location register, said communication path including said public base station controller in

6 communication with said public and private communication service unit and said public mobile  
7 switching center;

8 transmitting an acknowledgment message back to said message router via said  
9 communication path when it is determined that said mobile station is registered in one of said public  
A 10 home and visitor location registers for said public mobile communication service, said message  
11 router requesting said private visitor location register to analyze whether said mobile station in said  
12 common cell area is registered for said private mobile communication service;

13 determining whether the analysis performed by said private visitor location register indicates  
14 said mobile station in said common cell area is registered for said private mobile communication  
15 service;

16 transmitting a location registration request message from said message router to said private  
17 mobile switching center through said second private base station controller, wherein said second  
18 private mobile switching center registers the location of said mobile station in said private visitor  
19 location register.

1 19. (original) The apparatus as set forth in claim 15, wherein said wire and wireless complex  
2 function comprises:

3 informing a private mobile switching center of said public and private communication service  
4 unit that a call terminates at a wire extension terminal of a private branch exchange;

5 requesting, by said private mobile switching center, a private visitor location register to  
6 analyze whether there exists a mobile identification number of a private mobile communication

7 service-registered mobile station corresponding to the wire extension terminal;

8 determining, based on an analysis result obtained by said private visitor location register,  
9 whether the mobile identification number corresponding to the wire extension terminal exists for the  
10 private mobile communication service-registered mobile station;

A 11 ringing said wire extension terminal; and

12 transmitting a ring message to said private mobile communication service-registered mobile  
13 station, when it is determined that the mobile identification number corresponding to the wire  
14 extension terminal exists.

1 20. (new) A public/private mobile communication system for providing a public/private  
2 mobile communication service in association with a public land mobile network (PLMN) including  
3 a plurality of mobile stations (MSs), at least one mobile switching center (MSC), a plurality of public  
4 mobile communication network's base station controllers (BSCs) connected to the mobile switching  
5 center (MSC), and a plurality of public mobile communication network's base station transceiver  
6 subsystems (BTSs) connected to each of the base station controllers (BSCs), for forming a  
7 public-only cell area, the system comprising:

8 a public/private communication service unit connected to a particular one of the public  
9 mobile communication network's base station controllers (BSCs); and

10 at least one private base station transceiver subsystem (pBTS) connected to the public/private  
11 communication service unit, for forming a public/private common cell area;

12 wherein if a message received for a service requested by a particular one of the mobile

13 stations (MSs) is a public mobile communication service message, the public/private communication  
14 service unit provides a path designation to transparently transmit the received message to the public  
15 mobile communication network's base station controller (BSC) connected to the public/private  
16 communication service unit, and if the received message is a private mobile communication service  
17 message, the public/private communication service unit provides a path designation to a  
18 corresponding private mobile communication service.

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1 21. (new) The public/private mobile communication system of claim 20, wherein the  
2 public/private communication service unit comprises:

3 a call manager for determining whether a message received for a service requested by a  
4 particular one of the mobile stations (MSs) is a public mobile communication service message or  
5 a private mobile communication service message, and providing the path designation according to  
6 the determination result; and

7 a communication path former for forming a communication path for a corresponding service  
8 under the control of the call manager.

1 22. (new) The public/private mobile communication system of claim 21, wherein the  
2 communication path former comprises:

3 a private branched exchange (PBX);

4 a transcoder & selector bank (TSB) for performing traffic data interfacing between the  
5 private branched exchange (PBX) and a private base station controller (pBSC); and



6 a communication network connector connected to the transcoder & selector bank (TSB), the  
7 call manager, the private base station controller (pBSC), the at least one private base station  
8 transceiver subsystem (pBTS) and the particular one of the public mobile communication network's  
9 base station controllers (BSCs), for analyzing an address of a received message and providing a data  
10 path and a communication path so that the received message should be transmitted to a node of the  
11 corresponding address.

1 23. (new) The public/private mobile communication system of claim 22, wherein the call  
2 manager comprises:

3 a main controller for controlling the private base station transceiver subsystem (pBTS) for  
4 the public/private mobile communication service and controlling the path designation according to  
5 the public/private mobile communication service;

6 a private visitor location register in communication with the main controller, for managing  
7 private mobile communication service-registered subscriber information and location registration  
8 information of a private mobile communication subscriber; and

9 a message router with a routing table to which path information corresponding to each of  
10 received messages is mapped, for designating a path of a received message by consulting the routing  
11 table.

1 24. (new) The public/private mobile communication system of claim 21, wherein the call  
2 manager further comprises a manager for maintaining and managing a mobile communication

3 service function provided by the public/private communication service unit.

1 25. (new) The public/private mobile communication system of claim 23, wherein the call  
2 manager further comprises a wire/wireless interface controller for interfacing with a wire private  
3 branch exchange (PBX) and a mobile terminal registered for the private mobile communication  
4 service.

1 26. (new) The public/private mobile communication system of claim 23, wherein the call  
2 manager further comprises a short message service (SMS) controller for controlling a short message  
3 service for a mobile terminal registered for the private mobile communication service.

1 27. (new) The public/private mobile communication system of claim 20, wherein the  
2 public/private communication service unit is connected to a public switched telephone network  
3 (PSTN), an integrated services digital network (ISDN), or an Internet protocol (IP) network.

1 28. (new) A method for providing a public/private mobile communication service in  
2 association with a public land mobile network (PLMN) including a plurality of mobile stations  
3 (MSs), at least one mobile switching center (MSC), a plurality of public mobile communication  
4 network's base station controllers (BSCs) connected to the mobile switching center (MSC), and a  
5 plurality of public mobile communication network's base station transceiver subsystems (BTSs)  
6 connected to each of the base station controllers (BSCs), for forming a public-only cell area, the

7 method comprising the steps of:

8 providing a public/private communication service unit connected to a particular one of the  
9 public mobile communication network's base station controllers (BSCs), and at least one private  
10 base station transceiver subsystem (pBTS) connected to the public/private communication service  
11 unit, for forming a public/private common cell area;

12 determining by the public/private communication service unit whether a message for a  
13 service requested by a particular one of the mobile stations (MSs) is received or not; and

14 providing path designation to transparently transmit a received message to the base station  
15 controller (BSC) connected to the public/private communication service unit, if the message received  
16 for the service requested by the mobile station (MS) is a public mobile communication service  
17 message, and providing path designation to a corresponding private mobile communication service  
18 if the received message is a private mobile communication service message.

1 29. (new) The method of claim 28, further comprising the step of registering a location of  
2 the mobile station so that the public and private mobile communication can be provided.

1 30. (new) A method of claim 29, wherein a step of registering a location of the mobile  
2 station further comprises the steps of;

3 upon receiving a location registration request from a mobile station, transmitting by the  
4 public/private communication service unit the location registration request to a public mobile  
5 communication network's base station controller (BSC) connected to the private base station

6 transceiver subsystem (pBTS), and determining whether the mobile station is registered for a private  
7 mobile communication service; and

8 registering a location of the mobile station in an internal private visitor location register by  
9 the public/private communication service unit, if the mobile station is not registered for the private  
10 mobile communication service.

1 31. (new) The method of claim 30, further comprising the step of determining whether a  
2 location registration complete signal has been received from the base station controller (BSC), before  
3 determining whether the mobile station is registered for the private mobile communication service.

1 32. (new) The method of claim 30, further comprising the step of informing the mobile  
2 station that the mobile station has been registered for the private mobile communication service, after  
3 the locating registration.